MODEL 1-F

1Ø FIXED FREQUENCY OSCILLATOR

OPERATIONS AND SERVICE MANUAL

PACIFIC

POWER SOURCE CORP.

CERTIFICATION

Pacific Power Source Corporation certifies that this instrument was thoroughly tested and inspected and found to meet or excel its published specifications when it was shipped from the facility.

WARRANTY

Pacific Power Source Corporation warrants each unit to be free from defects in material and workmanship. For the period of two years after purchase, Pacific Power Source Corporation will repair or replace any unit returned to our plant in Huntington Beach, California, by the original buyer, with shipping both ways prepaid by the buyer. Pacific Power Source Corporation is not responsible for consequential damage arising from the use of its equipment.

1-F FET FIXED PLUG-IN OSCILLATOR

OPERATIONS AND SERVICE MANUAL

PACIFIC PART NO. 108550

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HUNTINGTON BEACH, CALIFORNIA 92649

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MODEL 1-F FET OSCILLATOR PLUG-IN

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1.0 GENERAL DESCRIPTION

1.1 General Characteristics

The 1-F plug-in consists of a FET stabilized linear oscillator. The frequency of its single phase output has been accurately preset at the factory in accordance with the purchase order. This module is recommended for single phase power source applications where frequency adjustment is not necessary.

It is designed for use with Pacific "K" Series AC power sources; but when powered by the appropriate AC input, it will function as a quality oscillator.

1.2 Performance Specifications

Frequency Control: Fixed, as specified by user, within the range 20-2000 Hz.

Amplitude Control: 0 to V max. by panel control with locknut.

Frequency Stability: 0.01% per ^{o}C.

Amplitude Stability: 0.003% per ^{o}C.

Distortion: 0.25% max.

Phase Angle Accuracy: 1^{o} (3 Ø units only)

1.3 Operating Characteristics

The 1-F plug-in is well suited for applications requiring quality power. Controls and indications are analog and mechanical and provide smooth control of output voltage. A one second time delay prevents application of the oscillator signal to the output until the oscillator has stabilized.

1.3.1 Frequency Range

The frequency range of the plug-in is 20-2000 Hz and is preset at the factory to the user's specified frequency.

1.3.2 Voltage Adjust

The voltage adjust control is a one-turn screwdriver control with a range of 0 to maximum output. After setting the output voltage, the locking nut should be tightened down.

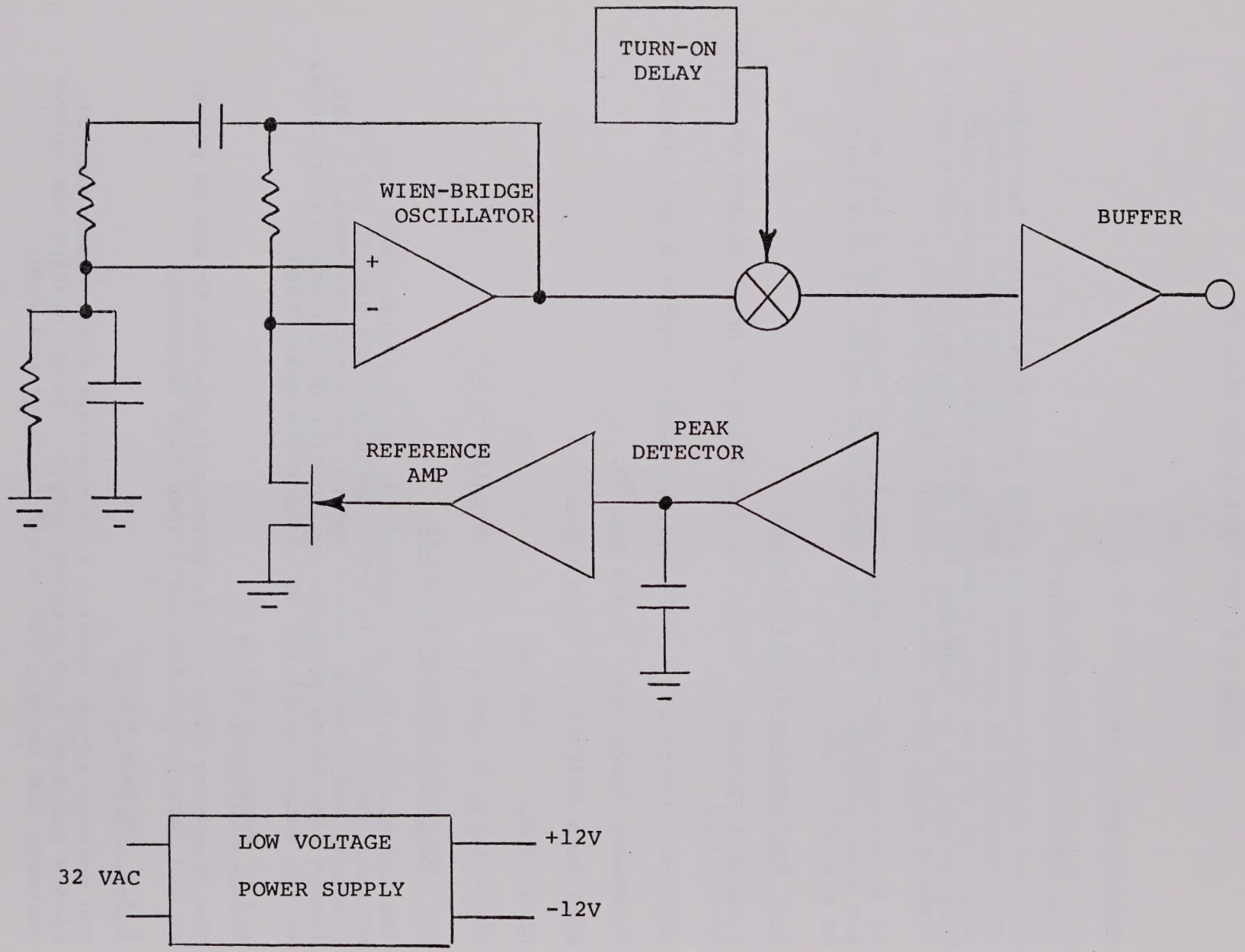


FIGURE 2.1A 1-F PLUG-IN SYSTEM BLOCK DIAGRAM

1.3.3 Voltage Metering

The AC output voltage is monitored by a 0-150 volt panel meter.

2.0 TECHNICAL DESCRIPTION

2.1 Theory of Operation

This plug-in uses a Wien-Bridge oscillator where amplitude is stabilized by a FET controlled AGC circuit. The frequency-determining components of the oscillator are preset at the factory. A slow turn-on circuit prevents application of the signal to the output until the oscillator has stabilized.

A rectifier power supply and integrated circuit regulator provide low voltage power.

Please refer to Figure 2.1A

2.2 Oscillator Card Assembly

2.2.1 Theory of Operation

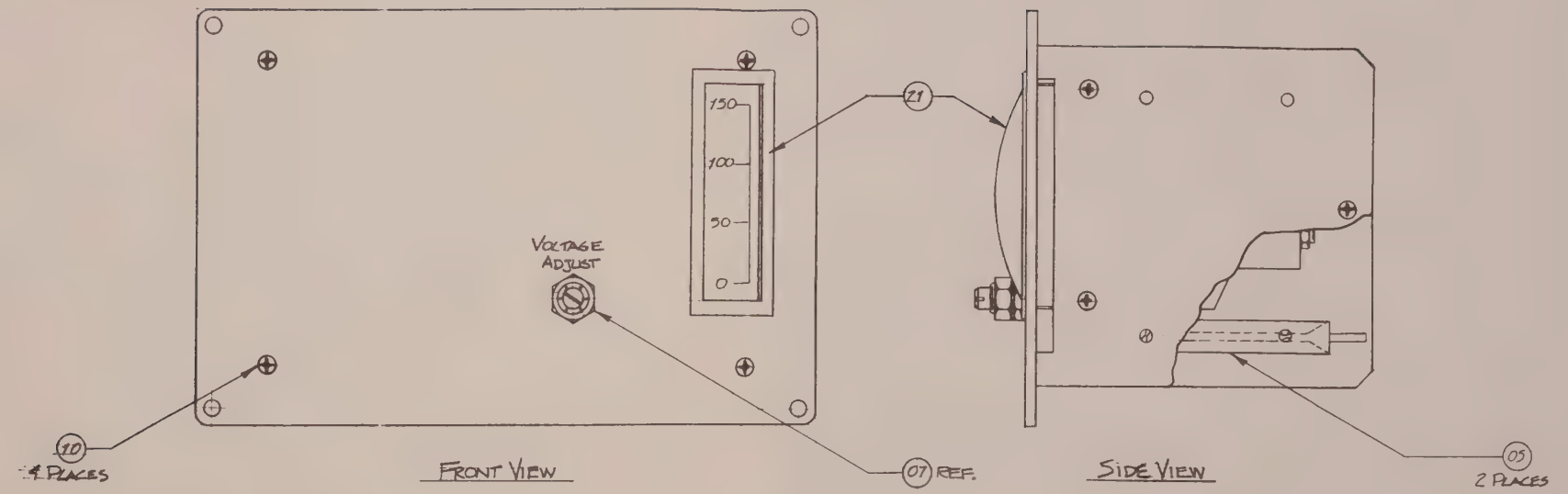
Refer to Figure 2.1A for a system block diagram of this assembly and to Figures 2.21A and B for schematic and layout details.

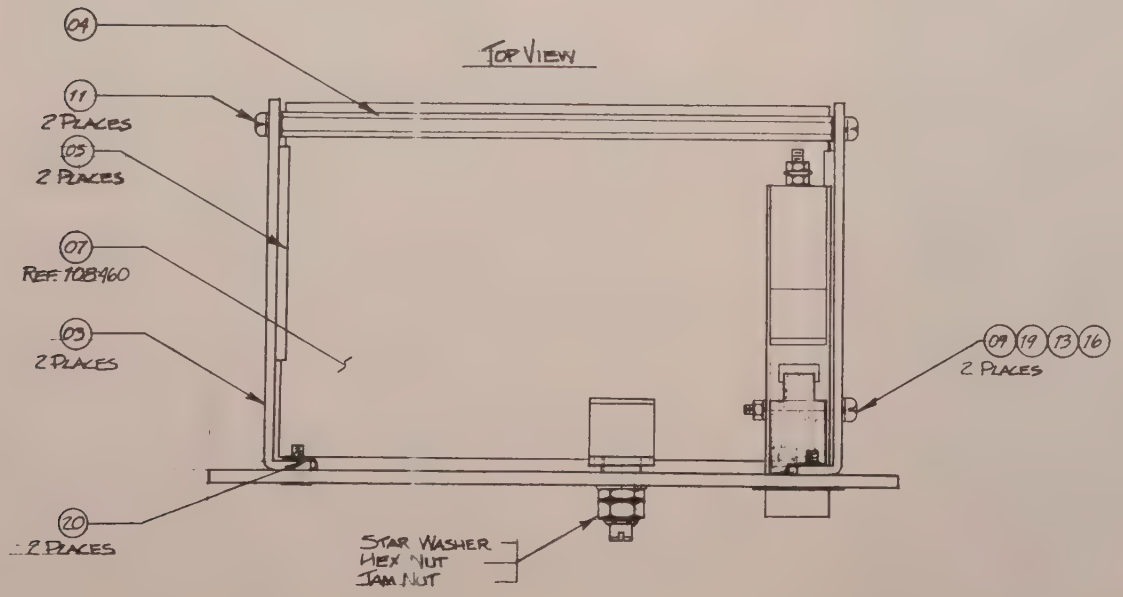
Amplifier A1 forms a Wien-Bridge oscillator; the timing components are all located on the board and are pre-selected at the factory. Jumpers determine whether the 20-200 or 200-2000 Hz range in use. The amplitude of the oscillator signal is determined by the control voltage of the FET Q1.

The output of A1 is peak-detected by a Q2 - C17; Q2 is pulsed on at the peak of the sine wave by the output of the comparator A3 whose input is phase shifted 90° by C13. This peak-detected signal is compared against reference zener CR2 and amplified by error amplifier A2 control the FET Q1. This servo loop stabilizes the output of the oscillator.

Another portion of A3 forms one second delay to prevent application of the signal to the output until the oscillator has stabilized. A1 buffers this output and scales it to the desired signal level.

Regulators V1 and V2 form the low voltage power supply.



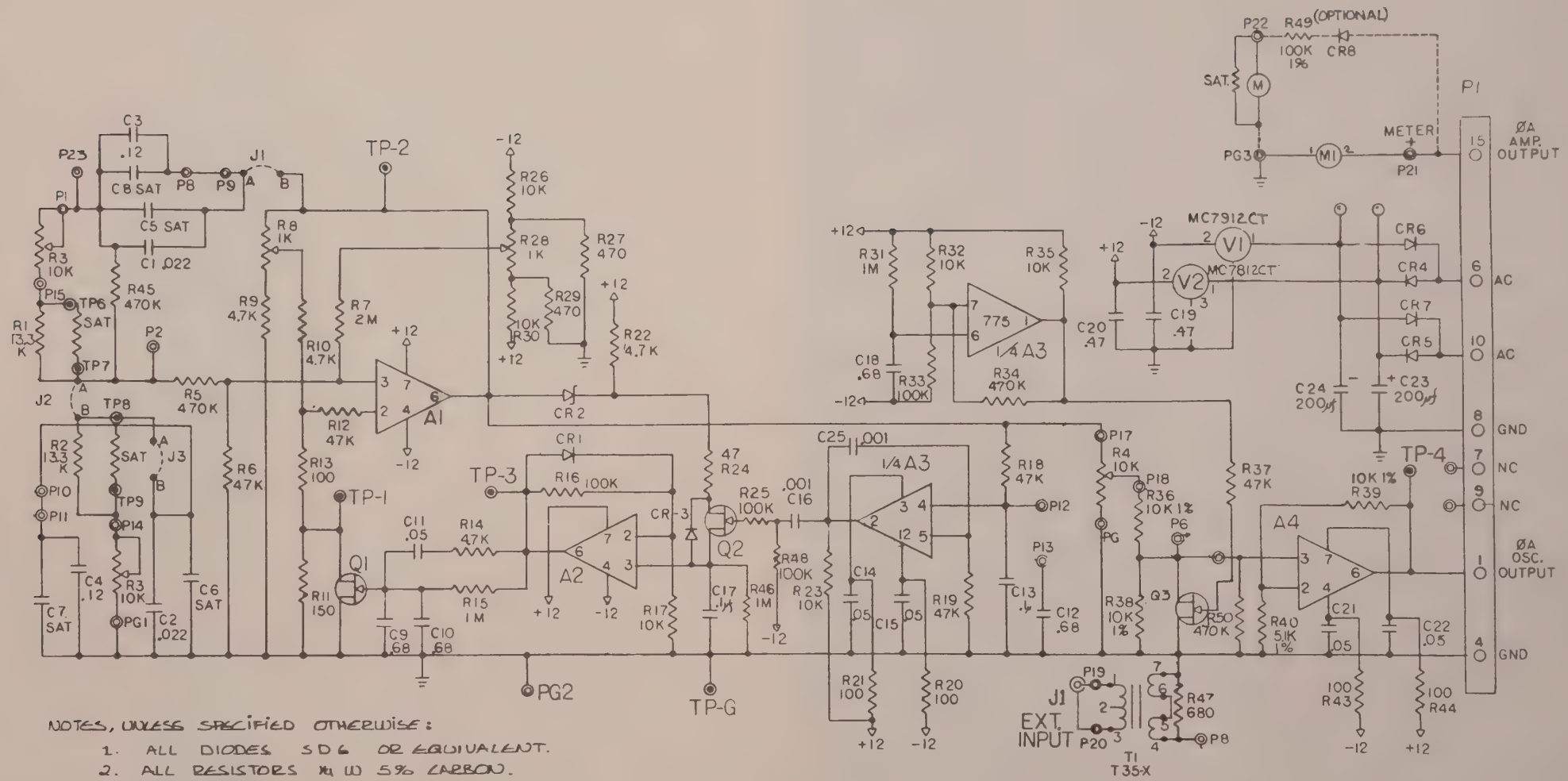


NOTES: UNLESS SPECIFIED OTHERWISE,

FIGURE 2.1B
SYSTEM ASSEMBLY DRAWING

PARTS LIST IF PLUG-IN MODULE DRAWING NO. 108500-1

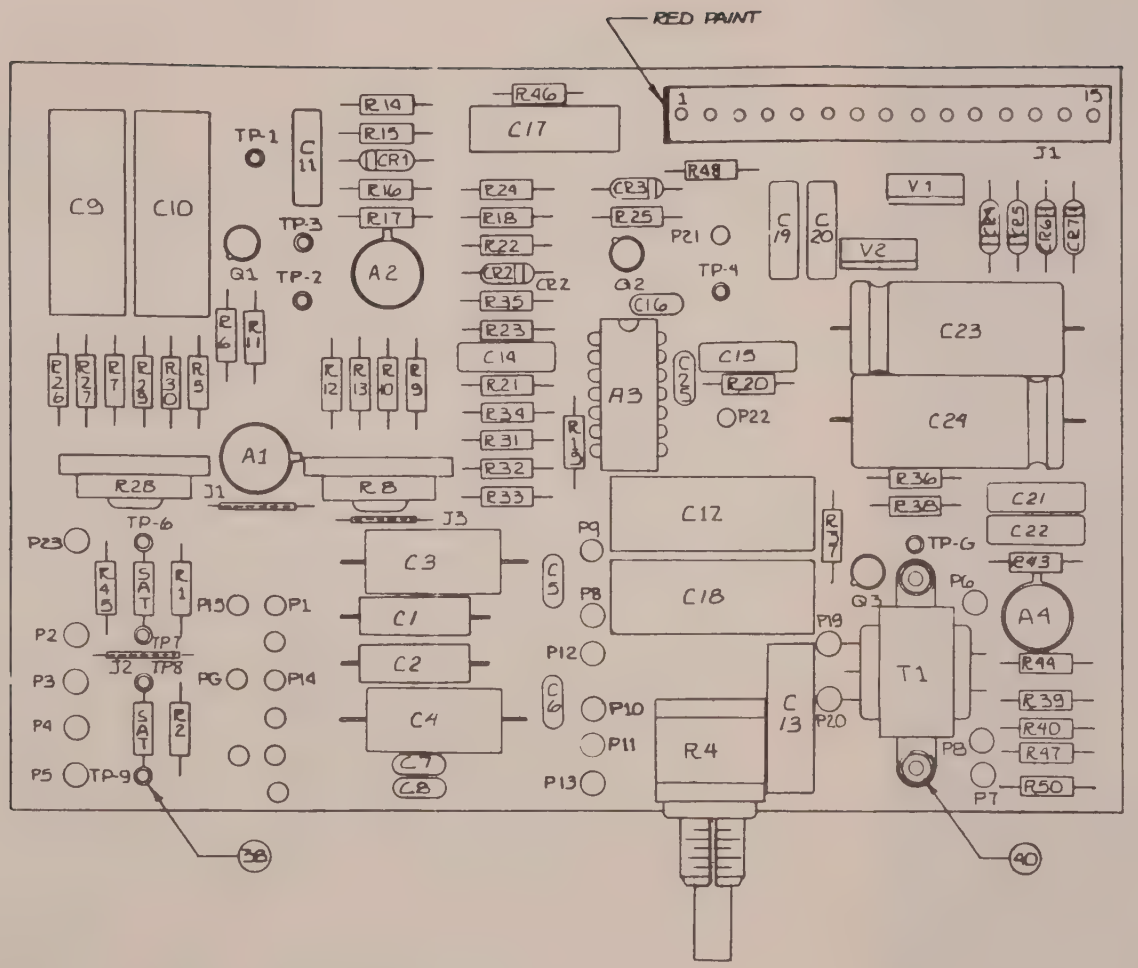
ITEM	DESCRIPTION	MFG P/N	MFG	QTY
01	FRONT PANEL	108501	PPSC	1
03	BRACKET, MOUNTING	108402	PPSC	2
04	SPACER	108304	PPSC	1
05	CARD GUIDE	1250F	SAE	2
07	PRINTED WIRING BRD.	PC108460	PPSC	1
21	METER	122-163-2-150	WESTON	1

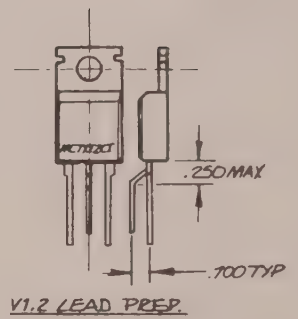


NOTES, UNLESS SPECIFIED OTHERWISE:

1. ALL DIODES 5D6 OR EQUIVALENT.
2. ALL RESISTORS ¼ W 5% CARBON.
3. AMPLIFIERS TO BE LM 741-C ⅛.
4. TRANSISTORS TO BE 2N 4859.
5. ⊙ DESIGNATES PAD.
6. ◉ DESIGNATES TEST POINT.
7. S1 SHOWN IN HIGH POSISTION.
8. P14 AND PG SPACED TO PERMIT SUBSITUTION OF ½ W RESISTOR FOR R3-B; SIMILAR SPACING FOR P1-P15, P6-P7, P12-P13.

FIGURE 2.2A
OSCILLATOR CARD SCHEMATIC DIAGRAM





NOTES: UNLESS SPECIFIED OTHERWISE.

1. ALL DIODES AND ¼ W RESISTORS TO BE BENT ON .500 CENTERS.
2. TERMINAL POSTS TO BE SWEDGED PRIOR TO COMPONENT INSTALLATION.
3. JUMPERS TO BE 20GA BUSS WITH TEFLON SLEEVE.
4. FOR I-F USE ONLY. INSTALL JUMPERS FROM P1-P15 AND PG TO P14 FOR 35-70 Hz. INSTALL JUMPERS FROM P8-P9, P10-P11, AND P12-P13. TO BE INSTALLED AT TEST.

FIGURE 2.2B
OSCILLATOR CARD ASSEMBLY DRAWING

PARTS LIST 1-V OSCILLATOR DRAWING NO. 108460-0

ITEM	DESCRIPTION	MFG P/N	MFG	QTY
	P.C. BOARD	PC108460	PEE	1
	CONNECTOR, 15 PIN	09-64-1151	MOLEX	1
	OP-AMPS A1,2,4	741-C	FAIRCHILD	3
	COMPARATOR, QUAD DIP A3	UA775	FAIRCHILD	1
	TRANSISTOR, FET Q1-3	2N4859	TEXAS IN.	3
	VOLTAGE REGULATOR - NEG. V1	7912CT	MOT	1
	VOLTAGE REGULATOR - POS. V2	7812CT	MOT	1
	RESISTOR 13.3K 1% R1,2	RN55C1332		2
	RESISTOR 10K 1% R36,38,39	RN55C1002		
	PTENTIOMETER R4	70M4LO48S103U	ALLEN BRAD	1
	10 K SINGLE GANG	81BIDB24A15	BOURNS	
	RESISTOR 470K 5% ¼W R5,50,34,45			4
	RESISTOR 47K 5% ¼W R6,12, 14,19,25,37,18			7
	RESISTOR 2M 5% ¼W R7			1
	TRIMPOT 1K R8,28	3353W102	BOURNS	2
	RESISTOR 4.7K 5% ¼W R9,19,22			3
	RESISTOR 150Ω 5% ¼W R11			1
	RESISTOR 100Ω 5% ¼W R13,20,21,41-44			7

ITEM	DESCRIPTION	MFG P/N	MFG	QTY
	DIODE, SIGNAL CR1,3,4,5, 6,7	IN4005		6
	ZENER CR-2	IN751A	MOT	1
	CAPACITOR .022µf @ 200V C1,2	730B1C223	ELECTROCUBE	2
	CAPACITOR .12 µf @ 200V C3,4	730B1C124	ELECTROCUBE	2
	CAPACITOR S.A.T. C5-8	730B1CXXX	ELECTROCUBE	A/R
	CAPACITOR .68 µf @ 50V C9,10,12,18	75F6R5684	G.E.	4
	CAPACITOR .05 µf @ 500V C11,14,15,27,21,22	5GA-S50	SPRAGUE	6
	CAPACITOR .1 µf @ 50V C13,17	75F3R5A104	G.E.	2
	CAPACITOR .001 µf @ 1 KV C16,25	230B1F102	ELECTROCUBE	2
	CAPACITOR 200 µf @ 50V C23,24	207G050FF7	SPRAGUE	2
	CAPACITOR .47 µf @ 50V C19,20	2CO23474D8500C4	SPRAGUE	2
	TRANSFORMER, SIGNAL T1	T35-X	TRIAD	1
	TERMINAL POST	1280B	USECO	9

3.0 CALIBRATION AND ALIGNMENT

3.1 Requirements

Pacific Power Source Corporation recommends that the calibration procedure be performed as six-month intervals. Instruments of four to ten times the accuracy of the test being performed should be used.

3.2 Oscillator Calibration

Monitor the output frequency using an external counter. If out of tolerance, reselect the select at test resistors from TP6-7 and TP8-9 for proper calibration. The values should be nearly identical.

Measure the voltage at TP1; if not within the range of 30±5 mv rms, adjust R8 to bring in spec.

3.3 Meter Calibration

The meter installed is an AC movement meter. If the meter is grossly out of calibration, it should be replaced.

3.4 DC Offset

DC offset is adjusted out by R28. Adjust R28 for a DC offset at Pin 1 of 0±10 mvdc. If the meter has difficulty reading this voltage, measure at P12.

5.0 ENGINEERING MODIFICATIONS